III. *An Experiment ſhewing, that the Springs or Conſtituent Parts of Air are capable to ſuffer ſuch diſorder, by a violent impulſe, as to require time to recover their Natural State; by Mr.* Fr. Hauksbee, F. R. S.

THE foregoing Experiment, being ſo very odd in its appearance, gave me the Curioſity to enquire a little farther into the matter of Fact, and to try whether Air could be capable of being Wounded, (if I may call it ſo), or to ſuffer ſuch a diſorder of Parts, by a violent impulſe, as to require time to recover their Natural State: I deviſed the following Experiment.

I took my Condenſing Engine, (which is ſo well known to this Society, I ſhall not need to deſcribe it here); into the bottom part of its Braſs Receiver I put about half a Pint of Water; then the upper part being ſcrew'd ſtrongly on, I threw into it, with the Syringe, about 3 or 4 Atmoſpheres of Air (as near as I could gueſs), ſuffering it to remain in that ſtate ſometime more than an Hour; then letting out as much of the Air (by taking off my Syringe) as would readily depart, I immediately ſcrew'd on in its Place a Box of Leather Collars, through which paſt a ſmall Glaſs Tube, whoſe lower Orifice was plung'd under the Surface of the included Water. I found in a very little time the Water had aſcended in the Tube near a Foot, and continued riſing

riſing for ſome time, till it had reach'd near 16 Inches; which plainly ſhews, that the Springs of Air, by being ſomewhat over bent, do not preſently (altho at Liberty) recover their Priſtine State. And were they to ſuffer a more violent compreſſure, and to remain for a Week, Month, or a Year, in the ſame State, I doubt not but according to the length of time, and degrees of Condenſation, a proportional time would be requir'd to recover them to their Natural State again. But what is the Force made uſe of in this Experiment, in compariſon to that of Fir'd *Gunpowder*, where the ſuddenneſs, and violentneſs of the Impulſe, is unaccountable; however, it ſerves well to confirm the Suggeſtion I had, that Air might ſo ſuffer in its Parts by Force or an Unnatural Extention of them, as to require time to recover their Priſtine Natural State.

Upon a Repetition of the ſame Experiment, only the Condenſed Air remained in the ſame ſtate, as at firſt injected, for about 18 Hours: then letting out the Air as before, the Premention'd Box with its Tube was ſcrew'd on; and upon Obſervation I found, that as the Springs of the Air did unbend themſelves, ſo they preſs'd more and more on the Surface of the included Water, which rais'd it higher and higher in the Tube, as they approach'd nearer their Natural State. This continued for about 6 Hours, at which time the little Tube was accidentally broke, and our farther Obſervations for that time fruſtrated.